## **CLAIMS**

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converter.

output signals.

1	1. A proximity detector, comprising:
2	a magnetic-field-to-voltage transducer for providing a magnetic field signal indicative
3	of an ambient magnetic field;
4	a peak detector responsive to said magnetic field signal for providing a tracking signal
5	which substantially follows at least a portion of said magnetic field signal, wherein said peak
6	detector comprises:
7	a first digital-to-analog converter for providing a first output signal having a first
8	step size;
9	a second digital-to-analog converter for providing a second output signal having
10	a second step size larger than said first step size; and
11	a summation circuit coupled to said first and said second digital-to-analog
12	converters for providing said tracking signal as a sum of said first and said second

- The proximity detector of Claim 1, further including a too-far-behind comparator for providing a too-far-behind signal which changes state when said magnetic field signal varies from said tracking signal by a predetermined amount, wherein said tracking signal is controlled in response to said too-far-behind signal.
- The proximity detector of Claim 2, wherein said peak detector further comprises:

  a first counter for providing a first count signal to said first digital-to-analog converter;

  and

  a second counter for providing a second count signal to said second digital-to-analog
- 1 4. The proximity detector of Claim 3, wherein in response to a first state of said too-farbehind signal said second counter is stepped in association with a terminal count of said first

- 3 counter, and in response to a second state of said too-far-behind signal said second counter is
- 4 also stepped.
- 1 5. The proximity detector of Claim 2, wherein said too-far-behind comparator is
- 2 responsive to an offset signal that differs from said magnetic field signal by an offset amount.
- 1 6. The proximity detector of Claim 1, further including a POSCOMP comparator for
- 2 providing a POSCOMP signal which changes state when said magnetic field signal varies from
- said tracking signal by a predetermined amount, wherein at least one of said tracking signal and
- 4 said magnetic field signal is forced towards the other one of said tracking signal and said
- 5 magnetic field signal in response to changes in state of said POSCOMP signal.
- 1 7. The proximity detector of Claim 6, wherein said POSCOMP comparator is responsive
- 2 to a threshold signal that differs from said tracking signal by a predetermined amount.
- 1 8. The proximity detector of Claim 6, wherein said tracking signal is brought to
- 2 substantially the same level as said magnetic field signal in response to changes in state of said
- 3 POSCOMP signal.
- 1 9. The proximity detector of Claim 6, wherein said magnetic field signal is brought to
- 2 substantially the same level as said tracking signal in response to changes in state of said
- 3 POSCOMP signal.
- 1 10. A method for detecting a ferrous article comprising the steps of:
- generating a magnetic field signal indicative of an ambient magnetic field;
- 3 generating a tracking signal which substantially follows at least a portion of said
- 4 magnetic field signal;
- 5 generating a too-far-behind signal which changes state when said magnetic field signal
- 6 varies from said tracking signal by a predetermined amount; and

- 7 changing step size of said tracking signal in response to transitions of said too-far-8 behind signal.
- 1 11. The method of Claim 10, wherein said changing step size comprises:
- 2 generating a first output signal having a first step size with a first digital-to-analog
- 3 converter;
- 4 generating a second output signal having a second step size larger than said first step
- size with a second digital-to-analog converter; and
- summing said first and said second output signals to provide said tracking signal.
- 1 12. The method of Claim 11, wherein said changing step size comprises:
- 2 counting with a first counter for providing a first count signal to said first digital-to-
- 3 analog converter; and
- 4 counting with a second counter for providing a second count signal to said second
- 5 digital-to-analog converter, wherein in response to a first state of said too-far-behind signal said
- 6 second counter is stepped in association with a terminal count of said first counter, and in
- 7 response to a second state of said too-far-behind signal said second counter is also stepped.
  - 13. The method of Claim 10, further including
- 2 generating a POSCOMP signal which changes state when said magnetic field signal
- 3 varies from said tracking signal by a predetermined amount; and
- 4 forcing at least one of said magnetic field signal and said tracking signal towards the
- 5 other one of said magnetic field signal and said tracking in response to transitions of said
- 6 POSCOMP signal.

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- 1 14. The method of Claim 13, wherein said POSCOMP signal changes state when a
- threshold signal differs from said tracking signal by a predetermined amount.

- 1 15. The method of Claim 13, wherein said forcing step comprises bringing said tracking
- 2 signal to substantially the same level as said magnetic field signal in response to transitions of
- 3 said POSCOMP signal.
- 1 16. The method of Claim 13, wherein said forcing step comprises bringing said magnetic
- 2 field signal to substantially the same level as said tracking signal in response to transitions of
- 3 said POSCOMP signal.
- 1 17. The method of Claim 10, wherein said step of generating the tracking signal comprises:
- 2 comparing said magnetic field signal to said tracking signal to generate said POSCOMP
- 3 signal;
- 4 counting with first and second counters in response to said POSCOMP signal to
- 5 provide first and second count signals; and
- 6 converting said first and second count signals to said tracking signal.
- 1 18. The method of Claim 17 further comprising generating a threshold signal at a
- 2 predetermined offset with respect to said tracking signal and using said threshold signal to
- 3 generate said POSCOMP signal.
- 1 19. The method of Claim 18, wherein said tracking signal level and said threshold signal
- 2 level are interchanged in response to transitions of said POSCOMP signal.